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I. AMENDMENTS TO THE SPECIFICATION

Please replace paragraph [0005] with the following amended paragraph:

[0005] EVTs are known in which range changes are controlled through a two-clutch synchronization and release process. Therein, a first clutch associated with a currently active range is carrying torque in an applied state and a second clutch associated with a currently inactive second range is carrying no torque in a released state. Shifting from the first range to the second range is accomplished by controlling the unapplied clutch to zero slip speed and the applying the clutch thereby placing the EVT in a two clutch application state. During the two-clutch application sate the engine is directly mechanically coupled to the output. The two clutch application state is exited and the second range effected by the release of the first clutch during control of the first clutch to zero slip speed. An exemplary such EVT and synchronous shift control is disclosed in co-pending and commonly assigned United States patent application Serial Number 10/686,510 ~~(Attorney Docket No. GP-304171)~~.

Please replace paragraph [0041] with the following amended paragraph:

[0041] Within MODE 1 or the first range, a general objective of the control system is to maintain C1 engagement for lower range operation and to control input speed to optimize performance parameters of the system. As such, C1 is commanded to maximum pressure to maintain the clutch fully engaged. C2 on the other hand is commanded to minimum pressure to maintain the clutch fully disengaged. Within MODE 2 or second range, a general objective of the control system is to maintain C2 engagement for lower range operation and to control input speed to optimize performance parameters of the system. As such, C2 is commanded to maximum pressure to maintain the clutch fully engaged. C1 on the other hand is commanded to minimum pressure to maintain the clutch fully disengaged. A preferred synchronous shift control is disclosed in co-pending and commonly assigned United States patent application Serial Number 10/686,510 ~~(Attorney Docket No. GP-304171)~~, incorporated herein by reference, which describes shifts from one mode to another occur synchronously - that is to say through a duration wherein the slip speed across both C1

and C2 is substantially zero with both C1 and C2 simultaneously applied and carrying torque – which effects direct mechanical coupling of the input to the output. Slip across both C1 and C2 may be simultaneously zero when both clutches are applied and carrying torque such as is the case when the transmission operates in a fixed-ratio mode in conjunction with or independent from a mode shift. Fixed-ratio mode is characterized wherein the input and output are mechanically coupled through the transmission at a fixed ratio, GR, whereby Ni is equivalent to the ratioed output speed, i.e. Ni=No*GR. This fixed ratio, GR, is also the effective gear ratio at any time the slip speed across both clutches is zero, including such times when slip across one or more clutches is controlled to zero by motor torque control. An exemplary speed control effectively utilized to control clutch slip through motor control is disclosed in co-pending and commonly assigned United States patent application Serial Number 10/686,511 (now U.S. Patent Number 7,219,000) ~~(Attorney Docket No. GP-304140)~~, incorporated herein by reference. The transmission is said to be synchronous when slip speed across both clutches is zero. The transmission is said to be operating in a fixed-ratio mode when operating synchronously with both clutches applied.

Please replace paragraph [0043] with the following amended paragraph:

[0043] Continuing with reference to FIG. 5, the undesirable engine lugging effects of a synchronous downshift from MODE 2 to MODE 1 during rapid vehicle deceleration are illustrated. Here, the ratioed output speed, No*GR, is illustrated as broken line 103 and input speed, Ni, is illustrated as solid line 105. Input speed is preferably controlled in accordance with the method disclosed in co-pending and commonly assigned United States patent application Serial Number 10/686,511 (now U.S. Patent Number 7,219,000) ~~(Attorney Docket No. GP-304140)~~. It is noted that with the direct coupled arrangement of the engine and EVT complement previously described that the engine speed and the input speed are equivalent and that reference to one herein may be read to refer to the other likewise. Dashed line 111 represents a governed low engine speed. Vehicle deceleration is represented by the rapid negative slope of the ratioed output speed line 103 since it essentially corresponds to a scaled measure of output speed. As the ratioed output speed converges upon the input speed, Ni 105, a shift is initiated to shift from MODE 2 to MODE 1 in accordance with the

synchronous shift control disclosed in co-pending and commonly assigned United States patent application Serial Number 10/686,510 ~~(Attorney Docket No. GP-304171)~~. Therefore, synchronous speeds are reached, clutches C1 and C2 are fully applied and fixed-ratio mode 107AB is invoked at a point substantially corresponding to line 107A. The fixed-ratio mode results in the input speed Ni (engine speed) being pulled down by the mechanical coupling of the output to the input. Such an aggressive deceleration as represented by the ratioed output speed may result in the input speed being pulled down below the governed low engine speed 111 before the shift progresses sufficiently to exit from fixed-ratio mode at line 107B into mode 1 whereat the mechanical coupling is no longer in effect. The point whereat the input speed is pulled below the governed low engine speed 111 substantially corresponding to line 109A marks the beginning of an engine lugging condition 109AB. A less aggressive deceleration would have a correspondingly shallower slope on the ratioed output speed line 103 and would not result in pulling the input speed down to the point of lugging the engine before the shift progresses sufficiently to exit from fixed-ratio mode at line 107B into mode 1 whereat the mechanical coupling is no longer in effect. In the present example, however, the engine lugging condition occurs substantially at line 109A prior to the fixed-ratio mode exit at line 107B. Subsequent to line 107B, the input speed recovers at least to the governed low engine speed 111 at line 109B and up to a higher controlled input speed. At line 109B the engine lugging condition is over. However, such engine lugging conditions are generally undesirable and it is an objective of the present invention to address such operation by providing a shift to the appropriate range in accordance with the shift through neutral control as later described below in conjunction with FIGS. 9, 11 and 13.

Please replace paragraph [0044] with the following amended paragraph:

[0044] Continuing with reference to FIG. 6, the undesirable engine overspeed effects of a synchronous upshift from MODE 1 to MODE 2 during rapid vehicle acceleration are illustrated. Here, the ratioed output speed, No*GR, is again illustrated as broken line 103 and input speed, Ni, is again illustrated as solid line 105. Input speed is preferably controlled in accordance with the method disclosed in co-pending and commonly assigned United States patent application Serial Number 10/686,511 (now U.S. Patent Number 7,219,000)

~~(Attorney Docket No. GP-304140)~~. Dashed line 111 represents a governed high engine speed. Vehicle acceleration is represented by the rapid positive slope of the ratioed output speed line 103 since it essentially corresponds to a scaled measure of output speed. As the ratioed output speed converges upon the input speed, Ni 105, a shift is initiated to shift from MODE 1 to MODE 1 in accordance with the synchronous shift control disclosed in co-pending and commonly assigned United States patent application Serial Number 10/686,510 ~~(Attorney Docket No. GP-304171)~~. Therefore, synchronous speeds are reached, clutches C1 and C2 are fully applied and fixed-ratio mode 107AB is invoked at a point substantially corresponding to line 107A. The fixed-ratio mode results in the input speed Ni (engine speed) being pulled up by the mechanical coupling of the output to the input. Such an aggressive acceleration as represented by the ratioed output speed may result in the input speed being pulled above the governed high engine speed 111' before the shift progresses sufficiently to exit from fixed-ratio mode at line 107B into mode 2 whereat the mechanical coupling is no longer in effect. The point whereat the input speed is pulled above the governed high engine speed 111' substantially corresponding to line 109A marks the beginning of an engine overspeed condition 109AB. A less aggressive acceleration would have a correspondingly shallower slope on the ratioed output speed line 103 and would not result in pulling the input speed up to the point of engine overspeed before the shift progresses sufficiently to exit from fixed-ratio mode at line 107B into mode 2 whereat the mechanical coupling is no longer in effect. In the present example, however, the engine overspeed condition occurs substantially at line 109A prior to the fixed-ratio mode exit at line 107B. Subsequent to line 107B, the input speed recovers at least to the governed low engine speed 111' at line 109B and down to a lower controlled input speed. At line 109B the engine overspeed condition is over. However, such engine overspeed conditions are generally undesirable and it is an objective of the present invention to address such operation by providing a shift to the appropriate range in accordance with the shift through neutral control as later described below in conjunction with FIGS. 10, 11 and 13.

Please replace paragraph [0051] with the following amended paragraph:

[0051] Steps 141 and 143 next ramp the output torque to zero beginning with the lesser of the present commanded output torque, To_des, or the starting torque used to calculate Torque_Ramp. In FIGS 7 and 8, torque ramping is shown beginning at times B and C, respectively. When the torque has been ramped to zero as shown in FIGS. 7 and 8 at times C and D, respectively, step 145 next begins the STN shift after a delay, STN_delay. The time delay is illustrated in FIGS. 7 and 8 at times C-D and D-E, respectively. At step 145 both clutches are commanded off to enter neutral mode. In the case of a first range violation, clutch C1 is commanded OFF as illustrated in FIG. 7 at time D. In the case of a second range violation, clutch C2 is commanded OFF as illustrated in FIG. 8 at time E. Next at step 147 the desired range is determined after which steps 149 and 151 work to control the slip speed of the clutch associated with the desired range to zero (Nc1 or Nc2). Preferably, the slip speed of the clutches in neutral mode is controlled through motor control in accordance with the method disclosed in co-pending and commonly assigned United States patent application Serial Number 10/686,511 (now U.S. Patent Number 7,219,000) ~~(Attorney Docket No. GP-304140)~~. Once substantially zero slip speed has been achieved, step 153 applies the corresponding clutch to establish torque capacity and complete the STN shift. Respective clutch applications are shown in FIGS. 7 and 8 at times E and F, respectively. After completion of the STN shift, such as may be indicated by the respective applied clutch's pressure switch, output torque begins recovering to a desired setpoint in accordance with normal EVT control. This is shown in FIGS. 7 and 8 at times F and G, respectively.

Please replace paragraph [0054] with the following amended paragraph:

[0054] At step 159 both clutches are commanded OFF to enter neutral mode. In the case of an acceleration violation, clutch C1 is commanded OFF as illustrated in FIG. 10. In the case of a deceleration violation, clutch C2 is commanded OFF as illustrated in FIG. 9. Next steps 161 and 163 work to control the slip speed of the clutch associated with the desired range to zero (Nc1 or Nc2). Preferably, the slip speed of the clutches in neutral mode is controlled through motor control in accordance with the method disclosed in co-pending and commonly assigned United States patent application Serial Number 10/686,511 (now U.S. Patent Number 7,219,000) ~~(Attorney Docket No. GP-304140)~~. Once substantially zero slip

speed has been achieved, step 165 applies the corresponding clutch to establish torque capacity and complete the STN shift. Respective clutch applications are shown in FIGS. 9 and 10 at times C. After completion of the STN shift, such as may be indicated by the respective applied clutch's pressure switch, normal EVT control is returned.